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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,375	11/21/2001	Akira Yamaguchi	Q66494	1311

7590 02/26/2004

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EXAMINER	
DHARIA, PRABODH M	

ART UNIT	PAPER NUMBER
2673	9

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/989,375	YAMAGUCHI, AKIRA	
	Examiner	Art Unit	
	Prabodh M Dharia	2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Priority

1. **Status:** Receipt is acknowledged of papers submitted on 01-26-2004 under amendments and new claims, which have been placed of record in the file. Claims 1-17 are pending in this action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-5, 7-12, 14,15, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (6,556,214 B1) in view of Yamaguchi Akira (JP 11-352954) and Priem et al. (4,908,780).

Regarding Claim 1, Yamada et al. teaches an image display method (Col. 2, Lines 23,24) of displaying an image (Col. 2, Lines 29, 30) on a monochrome display (Col. 11, Line 16) comprising the steps of: transferring digital image for displaying, by way of an interface for the digital data, using the digital data for displaying the transferred image (Col. 2, Lines 22-30, Col. 25, lines 27-30).

However, Yamada fails to teach monochrome display having sub-pixel structure, wherein image expressed by a number of steps of gradation for one sub-pixel being different from that for the other sub-pixels, using image data corresponded to the main pixel of the monochrome

display; and reproducing the image data corresponded to a number of steps of gradation as same as a number of steps of gradation of the one sub-pixel.

However, Yamaguchi et al. teaches monochrome display having sub-pixel structure (plurality of cell of monochrome picture pixel page 4, paragraph 6, Lines 1-4), wherein image expressed by a number of steps of gradation for one sub-pixel being different from that for the other sub-pixels, using image data corresponded to the main pixel of the monochrome display (page 4, paragraph 6, Lines 1 to page 5, paragraph 6, Line 4, paragraph 7, Line 1); and reproducing the image data corresponded to a number of steps of gradation as same as a number of steps of gradation of the one sub-pixel (page 10, paragraph 59, 60, page 9, paragraph 53, paragraph 54, Lines 1-10).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching Yamaguchi et al. of in Yamada et al. teaching to achieve higher gradation in a monochrome display unit.

Yamada et al. teaches an image display method (Col. 2, Lines 23,24) of displaying an image (Col. 2, Lines 29, 30) on a monochrome display (Col. 11, Line 16) comprising the steps of: transferring digital image for displaying, by way of an interface for the digital data, using the digital data for displaying the transferred image (Col. 2, Lines 22-30, Col. 25, lines 27-30).

However, Yamada fails to teach monochrome display having sub-pixel structure, wherein image expressed by a number of steps of gradation for one sub-pixel being different from that for the other sub-pixels, using image data corresponded to the main pixel of the monochrome display; and reproducing the image data corresponded to a number of steps of gradation as same as a number of steps of gradation of the one sub-pixel.

However, Priem et al. teaches monochrome display having sub-pixel structure, wherein image expressed by a number of steps of gradation for one sub-pixel being different from that for the other sub-pixels, using image data corresponded to the main pixel of the monochrome display; and reproducing the image data corresponded to a number of steps of gradation as same as a number of steps of gradation of the one sub-pixel (Col. 5, line 33 to Col. 6, Line 10).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Priem et al. in Yamada et al. teaching to achieve higher gradation in a monochrome display unit and smoothing of jagged edges is accomplished so that when viewing a video display, the eye will perceive the varying shades of gray as a more linear and less jagged line approaching the appearance of a video display having a resolution four times better than actual resolution.

Regarding Claim 2, Yamada et al. teaches the image data provided to the one sub-pixel are data provided for the displayed image, and the image data provided to the other sub-pixel are differential data with relative to the image data provided to the one sub-pixel (Col. 2, Lines 22-35, Col. 3, Lines 32-42, Col. 11, Lines 20-23, 34-45, 50-56). Yamaguchi et al. teaches image expressed by a number of steps of gradation for one sub-pixel being different from that for the other sub-pixels, using image data corresponded to the main pixel of the monochrome display (page 4, paragraph 6, Lines 1 to page 5, paragraph 6, Line 4, paragraph 7, Line 1).

Regarding Claim 3, Yamada et al. teaches an image display method (Col. 2, Lines 23,24) of displaying an image (Col. 2, Lines 29, 30) on a monochrome display (Col. 11, Line 16)

comprising the steps of: transferring digital image for displaying, by way of an interface for the digital data, using the digital data for displaying the transferred image (Col. 2, Lines 22-30, Col. 25, lines 27-30).Yamaguchi et al. teaches a number of steps of gradation of the image data corresponded to the one sub-pixel (page 4, paragraph 6, Lines 1 to page 5, paragraph 6, Line 4, paragraph 7, Line 1), being as same as a number of steps of gradation of an image displayed in the monochrome display (page 10, paragraph 63, 64), a number of steps of gradation of the image data corresponded to the other sub-pixels being represented by 1 bit (page 10, paragraph 63,64).; the monochrome display adding the image data represented by 1 bit to the image data of the one sub-pixel to create image data of the other sub-pixel, so that the image data is produced by sub-pixels corresponding to a number of steps of gradation being same between each of the pixels (page 10, paragraph 59, 60, page 9, paragraph 53, paragraph 54, Lines 1-10, paragraph 63,64, 65 page 11, paragraph 73).

Regarding Claim 4, Yamaguchi et al. teaches number of steps of gradation of the image displayed by the monochrome display being represented using 8 bit data (page 10, paragraph 63,64, page 11, paragraph 67, 73). Yamada et al. teaches number of steps of gradation of the image displayed by the monochrome display being represented using 8 bit data (Col. 2, Lines 22-35, Col. 3, Lines 32-42, Col. 11, Lines 20-23, 34-45, 50-56).

Regarding Claim 5, Yamaguchi et al. teaches monochrome display being a liquid crystal display (page 1, paragraph 57, Lines 4,5). Yamada et al. teaches a monochrome display (Col. 11, Line 16) being a liquid crystal display (Col. 30, Lines 18-22).

Regarding Claims 7, 8, 14,15, Yamada et al. teaches a monochrome display (Col. 11, Line 16) However, Yamada et al. fails to teach an image in a portrait orientation and video card. However, it is well known to one in the ordinary skill in the art an image in a portrait orientation and video card to drive video monitors (Inside Windows 3.11 New Rider Publishing, Jim Boyce et al. edition 1994, pages 138,139, Personal Computer Secrets, Bob O'donnell IDG Books 1999, Page 121,122).

Regarding Claim 9, Yamada et al. teaches an image display method (Col. 2, Lines 23,24) of displaying an image (Col. 2, Lines 29, 30) on a monochrome display (Col. 11, Line 16) unit having a sub-pixel structure in a main pixel (Col. 2, Lines 22-35, Col. 3, Lines 32-42, Col. 11, Lines 20-23, 34-45, 50-56), displays an image using image data (Col. 2, Lines 29,30); comprising the steps of: transferring digital image for displaying, by way of an interface for the digital data, using the digital data for displaying the transferred image (Col. 2, Lines 22-30, Col. 25, lines 27-30).

However, Yamada fails to teach monochrome display having sub-pixel structure, wherein image expressed by a number of steps of gradation for one sub-pixel being different from that for the other sub-pixels, using image data corresponded to the main pixel of the monochrome display; and reproducing the image data corresponded to a number of steps of gradation as same as a number of steps of gradation of the one sub-pixel.

However, Yamaguchi et al. teaches monochrome display having sub-pixel structure (plurality of cell of monochrome picture pixel page 4, paragraph 6, Lines 1-4), wherein image expressed by a number of steps of gradation for one sub-pixel being different from that for the

other sub-pixels, using image data corresponded to the main pixel of the monochrome display (page 4, paragraph 6, Lines 1 to page 5, paragraph 6, Line 4, paragraph 7, Line 1); and reproducing the image data corresponded to a number of steps of gradation as same as a number of steps of gradation of the one sub-pixel (page 10, paragraph 59, 60, page 9, paragraph 53, paragraph 54, Lines 1-10).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching Yamaguchi et al. of in Yamada et al. teaching to achieve higher gradation in a monochrome display unit.

Yamada et al. teaches an image display method (Col. 2, Lines 23,24) of displaying an image (Col. 2, Lines 29, 30) on a monochrome display (Col. 11, Line 16) comprising the steps of: transferring digital image for displaying, by way of an interface for the digital data, using the digital data for displaying the transferred image (Col. 2, Lines 22-30, Col. 25, lines 27-30).

However, Yamada fails to teach monochrome display having sub-pixel structure, wherein image expressed by a number of steps of gradation for one sub-pixel being different from that for the other sub-pixels, using image data corresponded to the main pixel of the monochrome display; and reproducing the image data corresponded to a number of steps of gradation as same as a number of steps of gradation of the one sub-pixel.

However, Priem et al. teaches monochrome display having sub-pixel structure, wherein image expressed by a number of steps of gradation for one sub-pixel being different from that for the other sub-pixels, using image data corresponded to the main pixel of the monochrome display; and reproducing the image data corresponded to a number of steps of gradation as same as a number of steps of gradation of the one sub-pixel (Col. 5, line 33 to Col. 6, Line 10).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Priem et al. in Yamada et al. teaching to achieve higher gradation in a monochrome display unit and smoothing of jagged edges is accomplished so that when viewing a video display, the eye will perceive the varying shades of gray as a more linear and less jagged line approaching the appearance of a video display having a resolution four times better than actual resolution.

Regarding Claim 10, Yamada et al. teaches the image data provided to the one sub-pixel are data provided for the displayed image, and the image data provided to the other sub-pixel are differential data with relative to the image data provided to the one sub-pixel (Col. 2, Lines 22-35, Col. 3, Lines 32-42, Col. 11, Lines 20-23, 34-45, 50-56). Yamaguchi et al. teaches image expressed by a number of steps of gradation for one sub-pixel being different from that for the other sub-pixels, using image data corresponded to the main pixel of the monochrome display (page 4, paragraph 6, Lines 1 to page 5, paragraph 6, Line 4, paragraph 7, Line 1).

Regarding Claim 11, Yamaguchi et al. teaches number of steps of gradation of the image displayed by the monochrome display being represented using 8 bit data (page 10, paragraph 63,64, page 11, paragraph 67, 73). Yamada et al. teaches number of steps of gradation of the image displayed by the monochrome display being represented using 8 bit data (Col. 2, Lines 22-35, Col. 3, Lines 32-42, Col. 11, Lines 20-23, 34-45, 50-56).

Regarding Claim 12, Yamaguchi et al. teaches monochrome display being a liquid crystal display (page 1, paragraph 57, Lines 4,5). Yamada et al. teaches a monochrome display (Col. 11, Line 16) being a liquid crystal display (Col. 30, Lines 18-22).

4. Claims 6,13, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (6,556,214 B1) in view of Yamaguchi et al. (JP 11-352954) and Priem et al. (4,908,780) as applied to claims 1-5,7-12, 14,15, above, and further in view of Nakayoshi et al. (6,310,667 B1).

Regarding Claim 6, Yamada et al. teaches a monochrome display (Col. 11, Line 16).

However, Yamada et al. modified by Yamaguchi et al. and Priem et al. fails to teach display with pixel number is equal to or larger than a pixel number of QXGA, having 2048 pixel multiplied by 1563 pixel.

However, Nakayoshi et al. teaches display with pixel number is equal to or larger than a pixel number of QXGA, having 2048 pixel multiplied by 1563 pixel (Col. 20, Line 56 to Col. 21, Line 22).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Nakayoshi et al. in Yamada et al. modified by Yamaguchi et al. and Priem et al. teaching to achieve higher definition and resolution in a monochrome display unit.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (6,556,214 B1) in view of Yamaguchi et al. (JP 11-352954) and Priem et al. (4,908,780) as applied to claims 1-5,7-12, 14,15, above, and further in view of Blakenbecler et al. (6,104,446).

Regarding Claim 16, Yamada et al. teaches a monochrome display (Col. 11, Line 16).

However, Yamada et al. modified by Yamaguchi et al. and Priem et al. fails to teach each sub-pixel is independently modulated.

However, Blakenbecler et al. teaches each sub-pixel is independently modulated (Col. 3, Lines 1-13).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Blakenbecler et al. in Yamada et al. modified by Yamaguchi et al. and Priem et al. teaching to achieve full range of color over the visible spectrum and of an improved backlighting panel in a monochrome display unit.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (6,556,214 B1) in view of Yamaguchi et al. (JP 11-352954) and Priem et al. (4,908,780) as applied to claims 1-5,7-12, 14,15, above, and further in view of Tomiyasu (5,491,496).

Regarding Claim 17, Yamada et al. teaches a monochrome display (Col. 11, Line 16).

However, Yamada et al. modified by Yamaguchi et al. and Priem et al. fails to teach the monochrome display unit has multiple sub-pixel per main pixel and further includes multiple adder circuits, wherein said one sub-pixel, represents a base value for displaying an image, and said adder circuits add values of one bit to the base value to obtain gradation values for the other sub-pixels.

However, Tomiyasu teaches the monochrome display unit (Col. 3, Lines 17-26) has multiple sub-pixel per main pixel (Col. 23, Lines 59-64), and further includes multiple adder

circuits (Col. 22, Lines 3-10 the addition is performed all the bits of registers, which require more than one adders or exclusive OR gates), wherein said one sub-pixel (Col. 23, Lines 59-64), represents a base value for displaying an image (Col. 7, Lines 3-6), and said adder circuits add values of one bit to the base value to obtain gradation values for the other sub-pixels (Col. 22, Lines 3-10, Col. 23, Lines 59-64).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Tomiyasu in Yamada et al. modified by Yamaguchi et al. and Priem et al. teaching to achieve a monochrome gradation display that is a faithful reproduction of tones of color display in a monochrome display unit which is a flat panel display.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (6,556,214 B1) in view of Yamaguchi et al. (JP 11-352954) and Priem et al. (4,908,780) and Tomiyasu (5,491,496) as applied to claims 1-5,7-12, 14,15,17 above, and further in view of Cok et al. (6,570,584 B1).

Regarding Claim 18, Yamada et al. teaches a monochrome display (Col. 11, Line 16).

However, Yamada et al. modified by Yamaguchi et al. Priem et al. and Tomiyasu fails to teach one sub-pixel has a different number of bit representation than the others.

However, Cok et al. teaches one sub-pixel has a different number of bit representation than the others (Col. 8, Lines 4,5).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Cok et al. in Yamada et al. modified by Yamaguchi et al., Priem et al.

and Tomiyasu teaching to achieve superior image rendition, superior calibration capabilities, increase efficiency and increase lifetime of the monochrome display by making one or more opf the colors within the gamut defined by the other colors.

Response to Arguments

8. Applicant's arguments with respect to claims 1,9, have been considered but are moot in view of the new ground(s) of rejection.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is informed that all of the other additional cited references either anticipate or render the claims obvious. In order to not to be repetitive and exhaustive, the examiner did draft additional rejection based on those references.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Suzuki et al. (6,476,824 B1) Luminance resolution enhancement circuit and display apparatus using same.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prabodh M Dharia whose telephone number is 703-605-1231. The examiner can normally be reached on M-F 8AM to 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 703-3054938. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

12. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 2023

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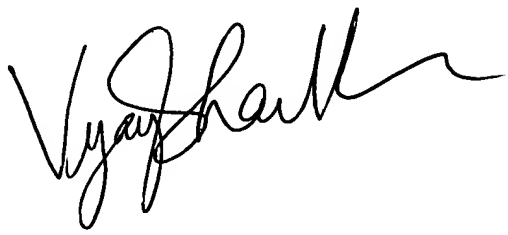
February 18, 2004



VIJAY SHANKAR
PRIMARY EXAMINER